

# PATENT SPECIFICATION



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## COMPLETE SPECIFICATION

### Improvements in Railway Coupler Heads

We, AMERICAN STEEL FOUNDRIES, a Corporation organized and existing under the Laws of the State of New Jersey, United States of America, of 410, North Michigan 5 Avenue, City of Chicago, County of Cook, State of Illinois, United States of America, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to railway car couplers and more particularly to automatically operated knuckle-type couplers such as 15 are recognized as standard equipment by the Association of American Railroads, or as used in some foreign countries which have adopted the knuckle type of coupler.

The object of the invention is to reinforce 20 the throat of a coupler head between its guard arm and knuckle pivot ears.

The invention consists in a railway coupler head in which there extends from a guard arm at one side of the head to top 25 and bottom knuckle pivot ears at the other side thereof, a throat beneath which there is formed integral with the lower surface of the bottom ear a ledge which extends between such surface and the lower edge 30 of the throat but spaced from the guard arm, said ledge being formed at its forward edge with a depending reinforcing rib, characterized in that such rib extends diagonally across the vertical center plane 35 of the head between the guard arm and the pivot ears, and the forward edge of such ledge is positioned to be spaced from the forward edge of a corresponding ledge on a mating coupler head when the coupler and 40 the mating coupler are engaged.

Referring now to the accompanying drawings:—

Fig. 1 is a bottom plan view of mated coupler heads embodying a preferred form 45 of the invention, the heads being shown in [Price 2/8]

extreme position of horizontal angling;

Fig. 2 is a top plan view of the structure shown in Fig. 1, under busting conditions;

Fig. 3 is a top plan view similar to Fig. 2 but showing the mechanism under pulling 50 conditions;

Fig. 4 is a sectional view on the line 4—4 of Fig. 3 with both couplers shown in condition of maximum upward angling;

Fig. 5 is a sectional view similar to that 55 of Fig. 4, but showing the couplers level under conditions of maximum vertical offset;

Fig. 6 is a sectional view on the line 6—6 of Fig. 1;

Fig. 7 is a fragmentary front elevational 60 view of one of the couplers shown in Fig. 1;

Fig. 8 is a fragmentary side elevational view taken on the line 8—8 of Fig. 7;

Fig. 9 is a top plan view of the couplers shown in Fig. 1 during a coupling operation; 65

Fig. 10 is a side elevational view of the structure shown in Fig. 9 partly in section on the line 10—10 thereof and showing the couplers under conditions of maximum vertical offset; 70

Fig. 11 is a bottom plan view of another modification of the invention;

Fig. 12 is a top plan view comparable to Fig. 2;

Fig. 13 is a top plan view showing the 75 mechanism under pulling conditions such as those shown in Fig. 3;

Fig. 14 is a sectional view on the line 14—14 of Fig. 13 with both couplers shown in condition of maximum upward angling; 80

Fig. 15 is a sectional view similar to that of Fig. 14 but showing the couplers level under conditions of maximum vertical offset;

Fig. 16 is a fragmentary front elevational view of one of the couplers shown in Fig. 11; 85 and

Fig. 17 is a fragmentary side elevational view taken on the line 17—17 of Fig. 16.

Describing the invention in detail and referring first to the embodiment thereof 90

illustrated in Figs. 1 to 10 inclusive, mated couplers are generally designated in Fig. 1 as 1 and 2 respectively. Each coupler comprises a head 3 having a guard arm 4 at one side thereof, and having top and bottom ears 6 and 8 at the opposite side thereof. A knuckle 10 of each coupler extends between its ears 6 and 8 and is pivoted upon a pin 14 movable in said ears. Each head also 10 comprises a throat 16 between its guard arm 4 and its pivot pin 14, the throat having a contour complementary to and engageable with a nose 18 of the mating coupler knuckle 10 when the couplers are subjected to buffing 15 forces, as illustrated in Fig. 2. It may be noted that the above-described construction is conventional and is thus not shown in detail.

Each coupler head 3 is provided with an 20 interlock shelf 20 underlying its throat 16. The forward edge of the shelf curves forwardly at 21 (Fig. 1) to merge with the bottom of the guard arm. The rear edge of the shelf 20 is connected to a web or leg 25 22 depending from the bottom of the coupler head 3 and extending arcuately from beneath the bottom ear 8 following approximately the contour of the throat 16 to the forward edge of the guard arm 4, as will be 30 best understood by a comparison of Figs. 1, 4 and 7. The shelf 20 is reinforced by a rib 24 depending therefrom and having a segment 25 extending diagonally with respect to the longitudinal vertical center plane of 35 the coupler head. The rib segment 25 extends across the shelf 20 beneath the throat 16 approximately midway between the merger of the throat with the guard arm 4 and the merger of the throat with the pivot 40 ears 6 and 8. The rib segment 25 is connected to an angularly related rib segment 26 which extends along the forward edge of shelf 20 and merges with the bottom ear 8.

Each shelf 20 is adapted to underlie the 45 knuckle 10 of a mated coupler, as clearly shown in Fig. 1 wherein it will be seen that the shelf 20 of each of the couplers 1 and 2 underlie the knuckle 10 of the other coupler under conditions of maximum angling. 50 Figs. 2 and 3 illustrate conditions of maximum buff and pulling, respectively, and Fig. 5 illustrates the manner in which the shelf 20 of coupler 2 engages the knuckle 10 of coupler 1 under pulling conditions and maximum vertical offset indicated at A in Fig. 5.

Fig. 4 illustrates both couplers 1 and 2 in a position of extreme upward angling and it will be seen in this Fig. that the upper rear edges of the knuckles 10 contact each other 60 and the lower forward edges of the knuckles 10 contact the front faces of the mating coupler heads at 28 thereby limiting such upward angling without contact between the forward edges of the shelves 20 thereby preventing damage thereto. It will also be 65

apparent that under a combination of vertical offset, as in Fig. 5, with vertical angling, as in Fig. 4, the limiting contact of the lower knuckle 10 will be against the web 22 of the related shelf 20. Inasmuch as the webs 22 70 are set back from the faces 28, increased angling is permitted under these conditions, but clearance is still maintained between the adjacent faces of the shelves 20.

In the embodiment used for the illustration 75 of the invention each shelf 20 (as seen in plan in Fig. 3 and in elevation in Fig. 7 and in the illustration of coupler 2 in Fig. 9) comprises three parts. Starting from the upper pivot ear 6 seen in Fig. 3, the first 80 part is a ledge 30 formed integral with the lower surface of the corresponding bottom ear 8 and extending between such surface and the lower edge of the throat 16 but spaced from the guard arm 4. The forward 85 edge of this ledge 30 lies in a plane tangential to the opening in the bottom ear 8.

Connected to the guard arm 4 is another part in the form of a ledge 31 located at a lower level than the ledge 30. Between the 90 ledges 30, 31 is the third part, viz.; the diagonal surface 32, which slopes downwardly from the upper surface of the ledge 30 and which has its lower extremity connected to the ledge 31. The forward edge 95 of the diagonal surface 32 and of the ledge 31 extends linearly of the forward edge of the ledge 30 in the same plane as said edge. It is not necessary that the shelf 20 be constituted of three parts as shown. The lower 100 edge 31 and also the diagonal surface 32 may be omitted, if desired. It will be noted that the rear edge of the ledge is connected to a web 22 depending substantially vertically from the head in rearward offset from the 105 front face of the head. In addition it will be noted that the rear edge of the diagonal surface 32 and of the ledge 31 are also connected to the vertically dependent web 22.

The ledge 30 extends at an angle to the 110 longitudinal vertical center plane of the coupler and joins the throat 16 at a point inwardly of the juncture of the throat with the guard arm, and the sloping surface 32, as best seen in Fig. 9, extends to a point 115 beneath the throat 16 at approximately the tangent point of the flat face of the throat to the base radius of the guard arm 4.

Fig. 9 and 10 also show the manner in which the nose 18 of an open coupler 120 knuckle 10 engages the lower ledge 31 during a coupling operation in the event that one of the couplers, as for example the coupler 1, in the illustration of Fig. 10 is lower than the other during such a coupling 125 operation.

It will be readily understood, as shown in Figs. 9 and 10, that as the couplers are coupled or mated the knuckle nose 18 of the coupler 1 which is lower than the coupler 130

2, slides up the sloping wall or surface 32 of the coupler 2 and seats on the upper ledge or level 30 to engage the throat 16 of coupler 2 and complete the coupling operation as 5 shown in Fig. 2.

Figs. 11 to 17 illustrate a modification of the invention wherein parts corresponding to those of the previously described embodiment are illustrated by corresponding 10 numerals. It will be noted that in the modification the shelf 20 is a one-level structure which, as best seen in Figs. 11 to 13, is adapted to underlie the nose 18 of the mated coupler in all positions of horizontal 15 angling, pulling, and buffing.

The extreme forward edge of the shelf 20 is in a plane approximately tangential to the coupler head pivot pin and its complementary openings in the ears 6 and 8. The forward edge of shelf 20 extends at an angle to this plane to the throat 16 joining the web 22 therebeneath at a point inwardly of the juncture of the throat with the guard arm 4, approximately beneath the tangent point 25 of the flat face of the throat 16 to the base radius of the guard arm 4.

The rear edge of each part of the shelf 20 is connected to the web 22 depending vertically from the bottom of the coupler 30 head 3 and extending arcuately from beneath the bottom ear 8 following approximately the contour of the throat 16 to the end of the shelf 20, as will best be understood by a comparison of Figs. 11, 14 and 17. The 35 shelf 20 is reinforced by a rib 24 depending therefrom and having a segment 25 extending diagonally along the edge of the shelf 20 which, as above noted, extends diagonally with respect to the longitudinal 40 vertical center plane of the coupler head.

The rib segment 25 extends along the edge of the ledge 30 beneath the throat 16 approximately midway between the longitudinal center plane of the coupler head and 45 the merger of the front face of the throat 16 with the base radius of the guard arm 4.

Fig. 14 illustrates both couplers 1 and 2 in a position of extreme upward angling, and it will be seen in this Fig. that the upper rear 50 edges of the knuckles 10 contact each other and the lower forward edges of the knuckles 10 contact the front faces of the mating coupler heads at 28 thereby limiting such upward angling without contact between the 55 forward edges of the shelves 20, thereby preventing damage thereto. It will be apparent that, under a combination of vertical offset as in Fig. 14 with vertical angling as in Fig. 15, the limiting contact of the 60 knuckle 10 shown at the right in Fig. 15 will be against the web 22 of the shelf 20, and that the web being set back from the face 28 permits increased angling while maintaining clearance between the outer faces of the 65 shelves 20.

As shown in Figs. 11, 16 and 17, each knuckle 10 is provided on the underside thereof with a lug 50 for reception of one end 52 of a coil torsion spring 54 positioned around the lower end of the pivot pin 14. 70 The other end 56 of the spring is anchored in a suitable hole 58 (Fig. 17) of the web 22 of the shelf whereby the spring is maintained under torsion tending to throw the knuckle 10 to its open position. 75

It will be apparent from reference to the various Figs. of the modification that this design of shelf provides satisfactory interlock by overlap of the shelf with the nose of the knuckle and affords ample strength 80 by providing a reinforcing rib directly beneath the point of load while still maintaining proper clearance for full angling of a knuckle incorporating a torsion spring lug. 85

What we claim is:—

1. A railway coupler head in which there extends from a guard arm at one side of the head to top and bottom knuckle pivot ears at the other side thereof, a throat beneath which there is formed integral with the lower 90 surface of the bottom ear a ledge which extends between such surface and the lower edge of the throat but spaced from the guard arm, said ledge being formed at its forward edge with a depending reinforcing rib, 95 characterized in that such rib extends diagonally across the vertical center plane of the head between the guard arm and the pivot ears, and the forward edge of such ledge is positioned to be spaced from the forward 100 edge of a corresponding ledge on a mating coupler head when the coupler and the mating coupler are engaged.

2. A railway coupler head according to Claim 1 in which the depending reinforcing 105 rib extends diagonally across the vertical center plane of the head beneath the mid-point of the throat.

3. A railway coupler head according to Claim 1 or 2 in which the forward edge of 110 the ledge lies in a plane approximately tangential to the opening in the bottom knuckle pivot ear.

4. A railway coupler head according to Claim 1, 2 or 3 wherein the ledge has its 115 upper surface connected to a diagonal surface sloping downwardly therefrom.

5. A railway coupler head according to Claim 4 wherein the lower extremity of the diagonal surface is connected to another 120 ledge which is connected to the guard arm.

6. A railway coupler head according to Claims 3, 4 and 5 in which the forward edge of the diagonal surface and of the ledge connected to the lower extremity of the diagonal 125 surface extends linearly of the forward edge of the edge in the same plane as said edge.

7. A railway coupler head according to any preceding claim in which the rear edge of the ledge is connected to a web depend- 130

ing substantially vertically from the head in rearward offset from the front face of the head.

8. A railway coupler head according to Claim 7 in which the rear edge of the diagonal surface and of the ledge connected to the lower extremity of such surface are also connected to the vertically dependent web.

10 9. A railway coupler head according to Claim 7 or 8 in which the web has approximately the contour of the throat of the coupler.

10. A railway coupler head according to Claim 7, 8 or 9 in which the web is provided beneath the bottom knuckle pivot ear with anchorage means for a torsion spring.

11. A railway coupler head substantially as hereinbefore described with reference to and as illustrated by Fig. 1 to 10 or Figs. 11 to 17 of the accompanying drawings.

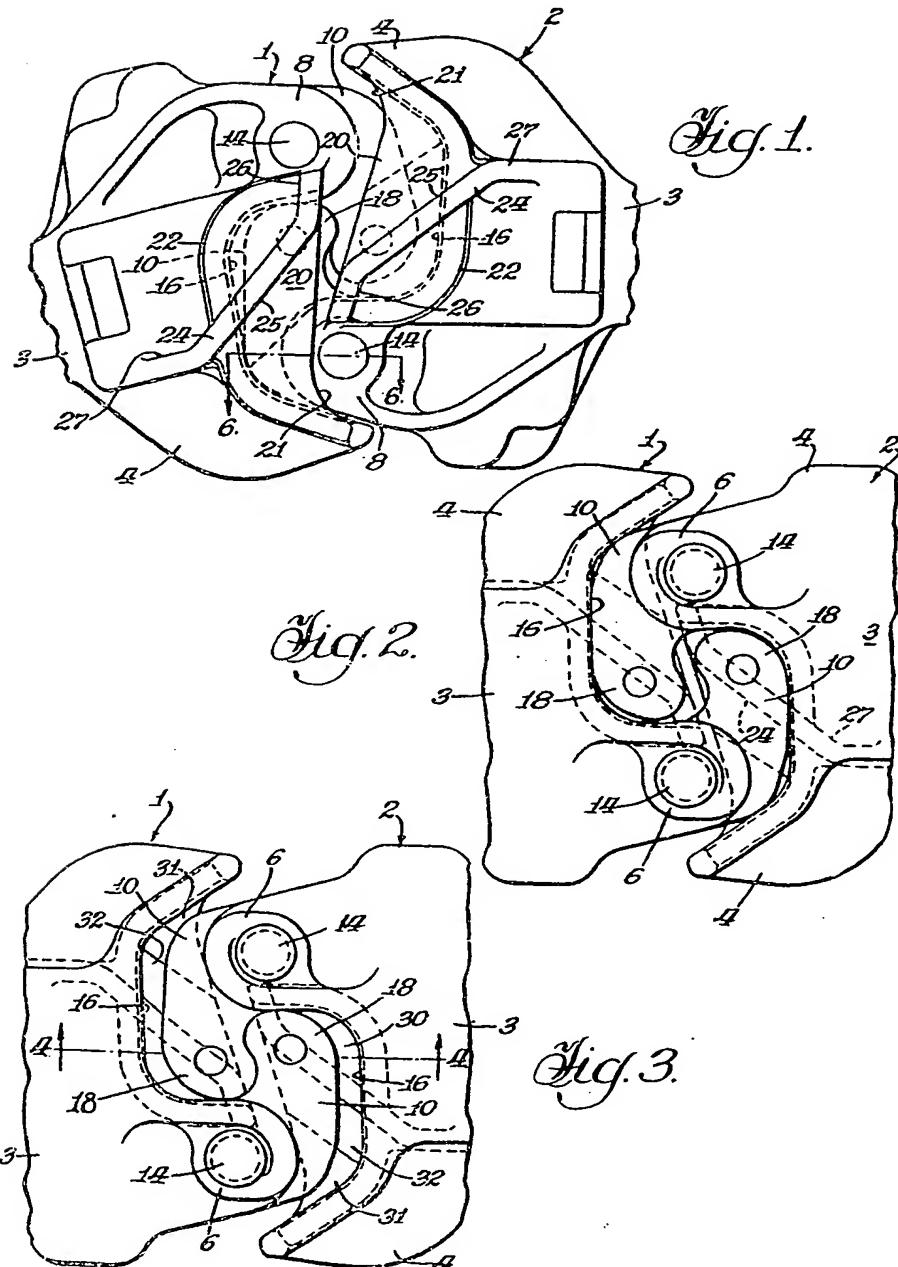
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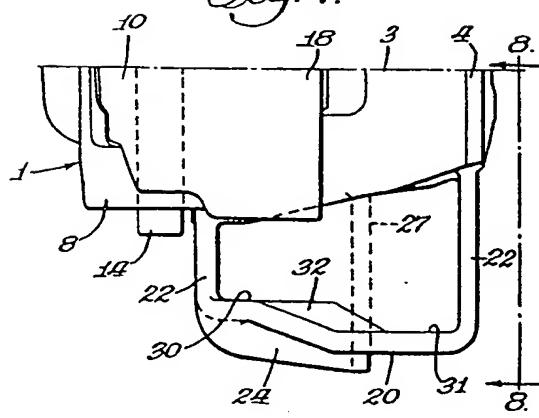
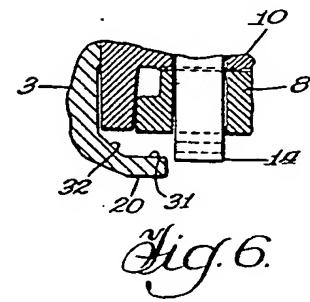
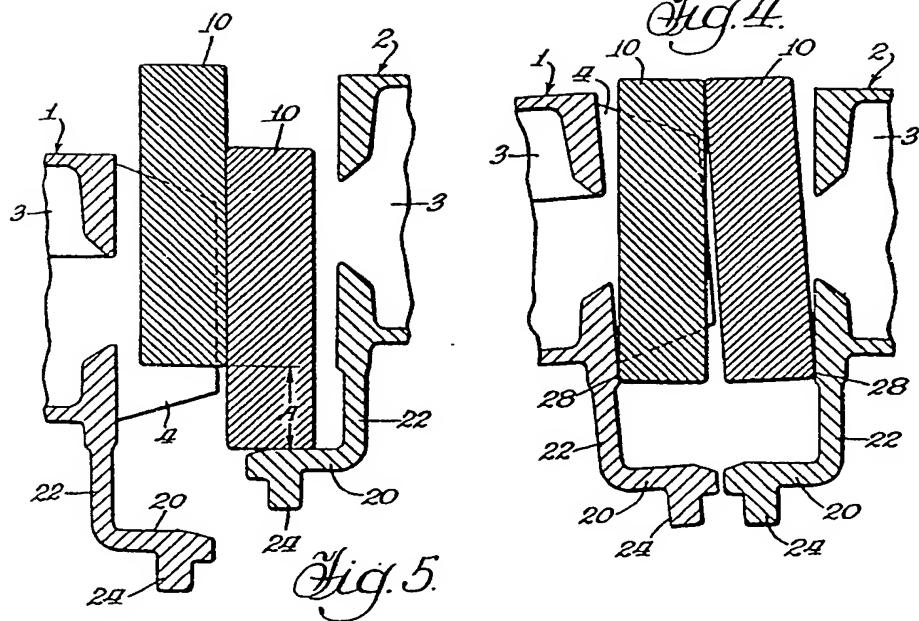
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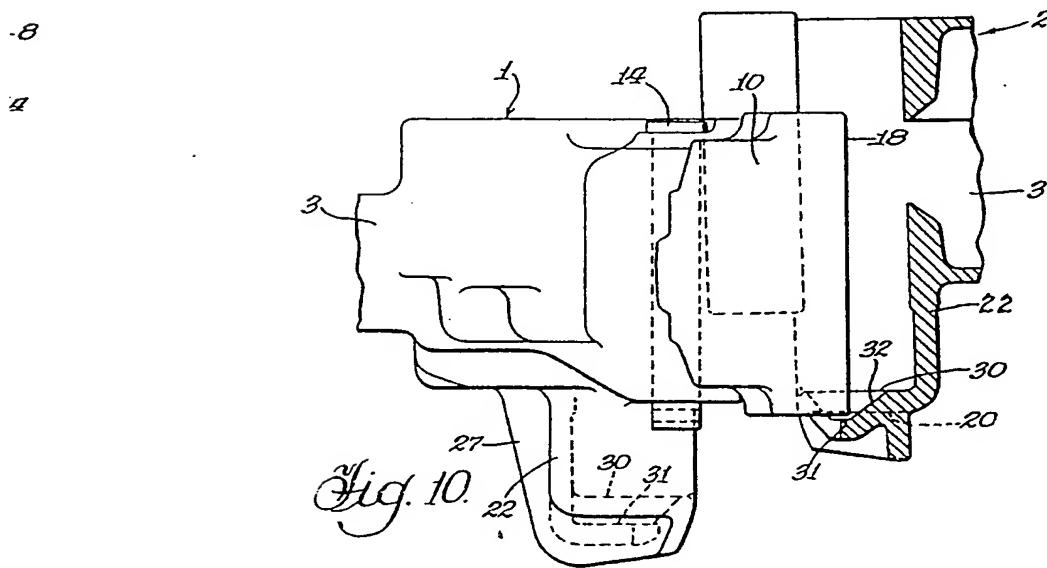
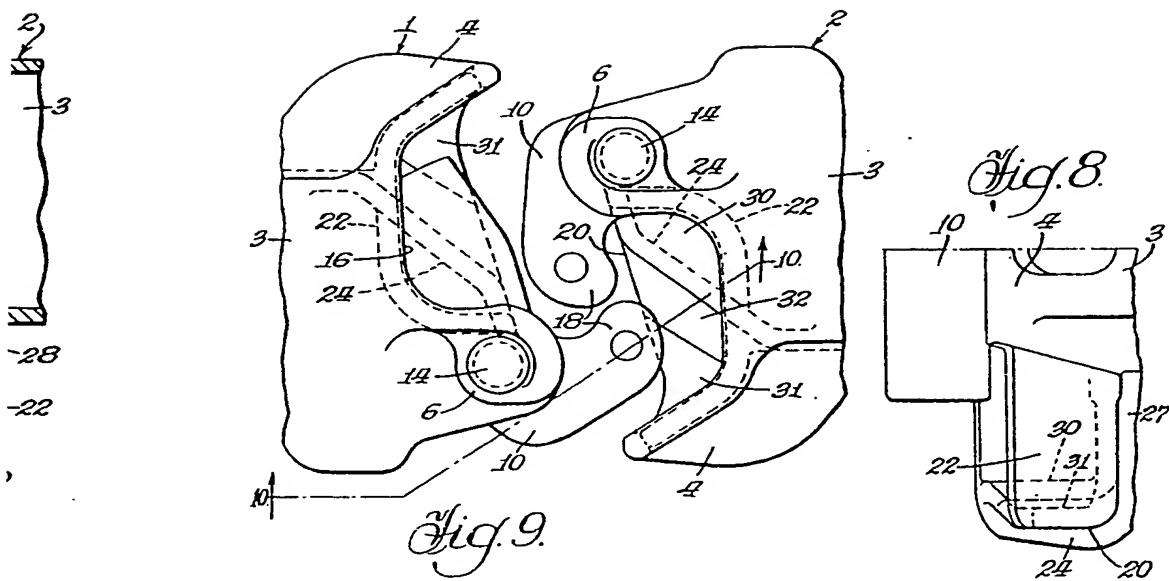


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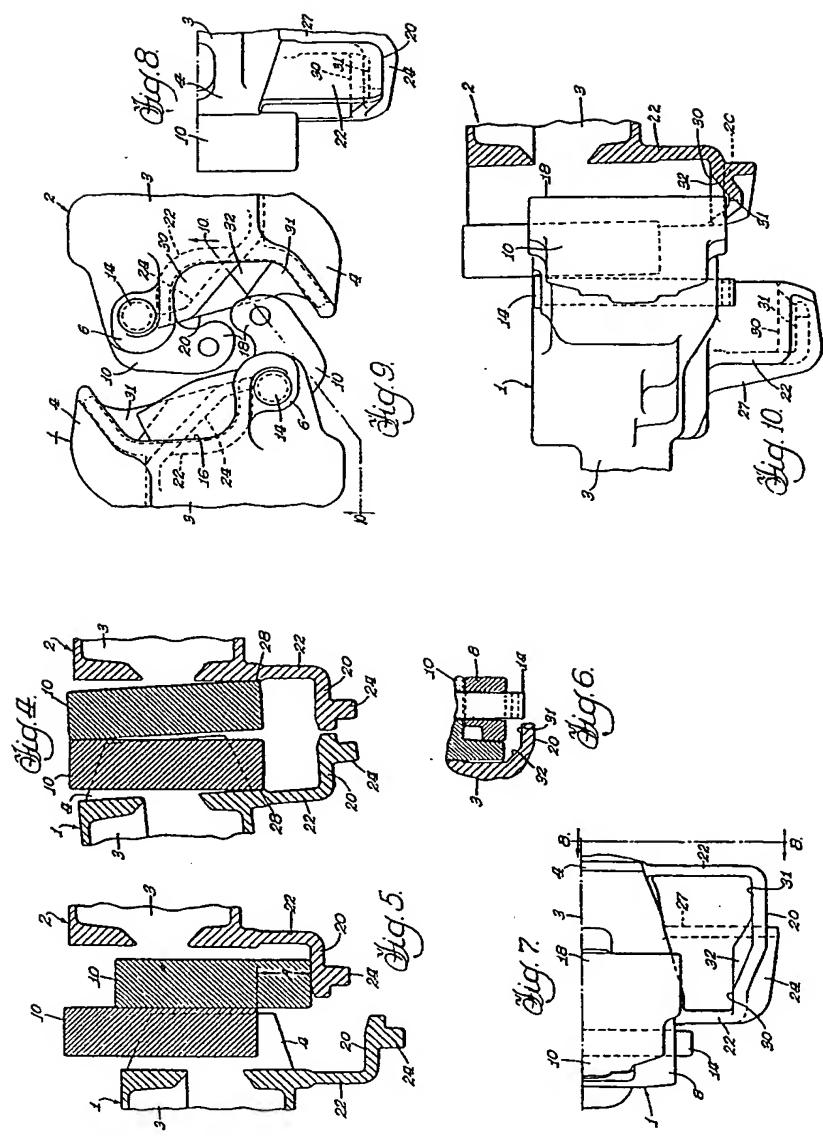
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SHEETS 2 & 3



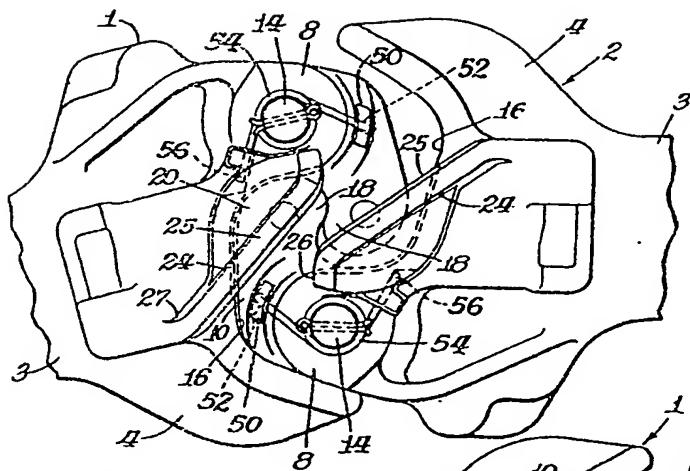


Fig. 11.

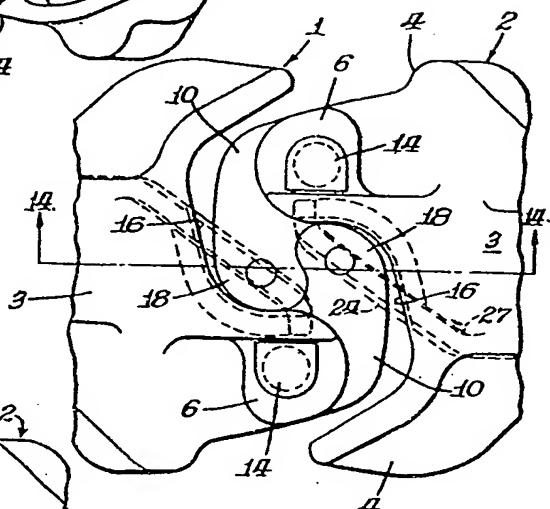


Fig. 12.

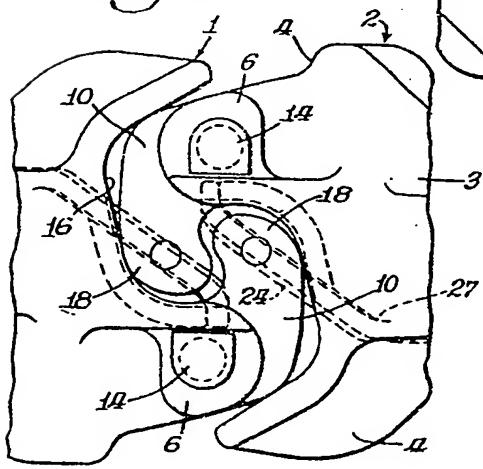


Fig. 13.

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SHEETS 4 & 5

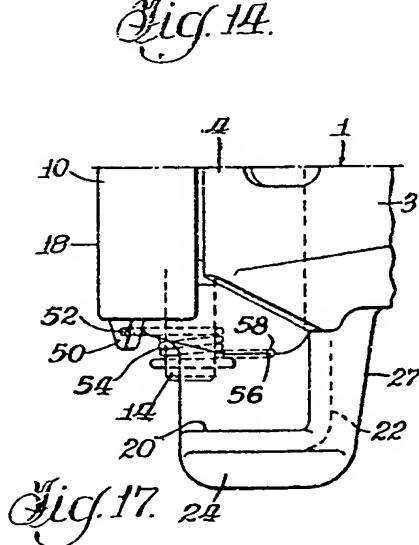
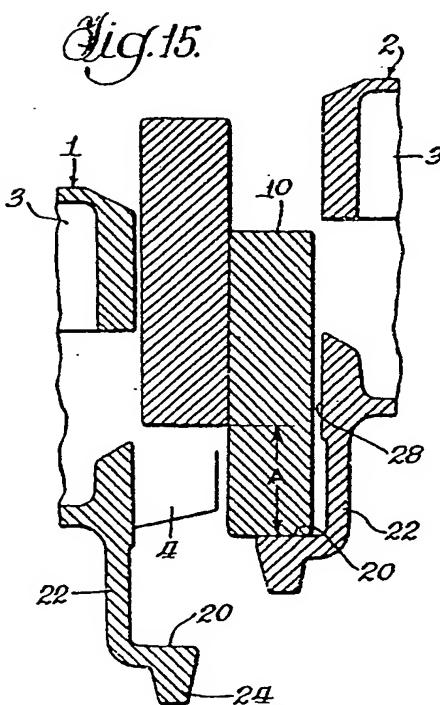
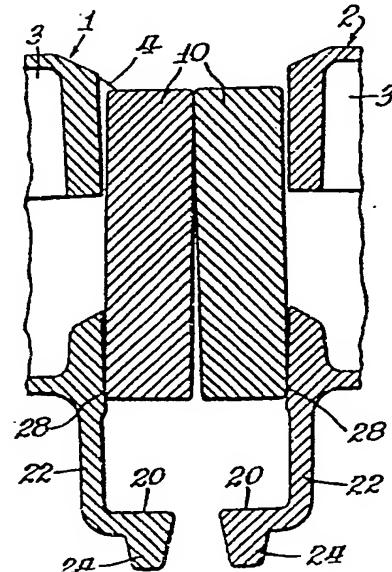
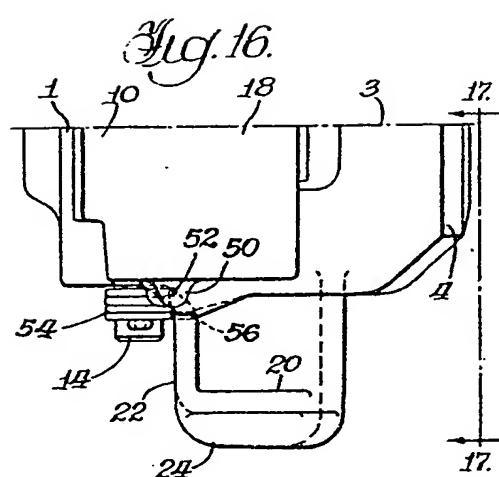


Fig. 17. 24

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